**Indian School Al Wadi Al Kabir**

**Mid Term Examination**

**ARTIFICIAL INTELLIGENCE (CODE:417)**

Class: X Time: 2 Hour

Date: 14/09/2023 Max. Marks: 50

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| General Instructions:  **SECTION A**: I. All Questions are compulsory.  **SECTION B**:  II. Answer any 7 out of the given 8 questions each carries 2 marks.  III.Answer any 3 questions out of given 5 questionseach carries 4 marks. |

**SECTION A: OBJECTIVE TYPE QUESTIONS**

1. **ANSWER ALL THE FOLLOWING: (24 x 1 =24 marks)**

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| 1 | \_\_\_\_\_\_\_\_\_\_is a step-by-step process to solve problems using proven scientific methods and drawing inferences about them.  **Project Cycle** |
| 2 | Name all the stages of an AI Project cycle. **Problem Scoping, Data Acquisition, Data Exploration, Modeling, Evaluation** |
| 3 | smart washing machine an example of an Artificially Intelligent devices. (True/False)  **False** |
| 4 | \_\_\_\_\_\_\_\_\_\_is the field of study that combines domain expertise, programming skills, and knowledge of mathematics and statistics to extract meaningful insights from data.  **Data science** |
| 5 | The dataset provided to the model ML. algorithm after training the algorithm is called\_\_\_\_\_\_\_\_\_  **Testing Dataset** |
| 6 | The ability to perceive the visual world and the relationship of one object to another is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  **Spatial Visual Intelligence** |
| 7 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_help us to find the relationship between the elements of the problem which we have scoped.  **System maps** |
| 8 | Mention two types of machines which have evolved with time.  **Television/Mobile Phones/ Ceiling Fans/ Microwave ovens/ Headphones / Speakers/ Harvesters/ Refrigerators/Air Conditioners etc.** |
| 9 | What do you mean by Data Features?  **The type of data to collect, It should be relevant data.** |
| 10 | A \_\_\_\_\_\_\_\_\_is a computer program designed to simulate conversation with human users.  **Chatbot** |
| 11 | Which type of graphical representation suits best for continuous type of data like monthly exam scores of a student? **Line graph** |
| 12 | Chickens feed extravagantly while the moon drinks tea.  The above statement is the example of?  **Example of Perfect syntax, no meaning** |
| 13 | Mention 2 applications of Natural Language Processing.  **Natural Language Processing Applications-**  **● Sentiment Analysis. ● Chatbots & Virtual Assistants. ● Text Classification. ● Text Extraction. ● Machine Translation ● Text Summarization ●Market Intelligence ● Auto-Correct** |
| 14 | \_\_\_\_\_\_\_\_\_\_\_\_\_is a term used for any word or number or special character occurring in a sentence.  **Tokens** |
| 15 | Artificial Intelligence covers a broad range of domains and applications and is expected to impact every field in the future.(True/False)  **True** |
| 16 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_takes in the data of Natural Languages in the form of written words and spoken words which humans use in their daily lives and operates on this.  **Natural Language Processing** |
| 17 | His face turns red after consuming the medicine  The above statement is the example of?  **Example of Multiple meanings of a word** |
| 18 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a system of moral principles and techniques intended to inform the development and responsible use of artificial intelligence technology.  **AI ethics** |
| 19 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an example of pocket assistants  **Alexa, Google Assistant, Cortana, Siri** |
| 20 | A \_\_\_\_\_\_\_\_\_\_\_\_\_is a set or collection of data.  **Data set** |
| 21 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_are one of the most basic and initial applications of NLP online.  **Email filters** |
| 22 | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is one of the ethical concern in AI.  •**Moral issues**  **• Data privacy**  **• AI Bias**  **• AI Access** |
| 23 | As you move towards deploying your model in the real-world, you test it in as many ways as possible. The stage of testing the models is known as \_\_\_\_\_\_\_\_\_\_\_\_.  **Evaluation.** |
| 24 | What are stop words?  **“Stop words” are the most common words in a language like “the”, “a”, “on”, “is”, “all”. These words do not carry important meaning and are usually removed from texts. It is possible to remove stop words using Natural Language Toolkit (NLTK), a suite of libraries and programs for symbolic and statistical natural language processing.** |

**SECTION B: SUBJECTIVE TYPE QUESTIONS**

**II.ANSWER ANY 7 OUT OF THE GIVEN 8 QUESTIONS (7 X 2M = 14 MARKS)**

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| 1 | Write the difference between Stemming and Lemmatization  Stemming is a technique used to extract the base form of the words by removing affixes from them. It is just like cutting down the branches of a tree to its stems. For example, the stem of the words eating, eats, eaten is eat. Lemmatization is the grouping together of different forms of the same word. In search queries, lemmatization allows end users to query any version of a base word and get relevant results.  OR  Stemming is the process in which the affixes of words are removed and the words are converted to their base form.  In lemmatization, the word we get after affix removal (also known as lemma) is a meaningful one. Lemmatization makes sure that lemma is a word with meaning and hence it takes a longer time to execute than stemming.  OR  Stemming algorithms work by cutting off the end or the beginning of the word, taking into account a list of common prefixes and suffixes that can be found in an inflected word. Lemmatization on the other hand, takes into consideration the morphological analysis of the words. To do so, it is necessary to have detailed dictionaries which the algorithm can look through to link the form back to its lemma. |
| 2 | Mention four examples of machines that are smart but not AI.  Automatic gates in shopping malls / remote control drones/ a fully automatic washing machine/ Air Conditioner/ Refrigerator/ Robotic toy cars/ Television etc. |
| 3 | What is a problem statement template and what is its significance?  The problem statement template gives a clear idea about the basic framework required to achieve the goal. It is the 4Ws canvas which segregates; what is the problem, where does it arise, who is affected, why is it a problem? It takes us straight to the goal. |
| 4 | Define Deep Learning  Deep Learning is the most advanced form of Artificial Intelligence. In Deep Learning, the machine is trained with huge amounts of data which helps it in training itself around the data. Such machines are intelligent enough to develop algorithms for themselves.  OR  Deep learning is an artificial intelligence (AI) function that imitates the workings of the human brain in processing data and creating patterns for use in decision making.  OR Deep learning is a subset of machine learning where artificial neural networks, algorithms inspired by the human brain, learn from large amounts of data |
| 5 | Write any 2 differences between Structured data and Unstructured data.  Structured Data:  • Structured data is categorized as quantitative data.  • Structured data has predefined data types and format so that it fits well in the column/fields of database or spreadsheet.  • They are highly organised and easily analysed.  • Examples of Structured data are: Name, age, address, cricket score board, school time table etc.  Unstructured Data:  • Unstructured data is categorized as qualitative data.  • Unstructured data is difficult to deconstruct because it has no predefined model, meaning it cannot be organized in relational databases.  • Examples of unstructured data include text, video, audio, mobile activity, social media activity, satellite imagery, surveillance imagery and the list goes on. |
| 6 | What is Computer Vision? Give an example of it.  Computer Vision, abbreviated as CV, is a domain of AI that depicts the capability of a machine to get and analyze visual information and afterwards predict some decisions about it. The entire process involves image acquiring, screening, analyzing, identifying and extracting information.  OR  Computer vision is an interdisciplinary field that deals with how computers can be made to gain high-level understanding from digital images or videos.  OR  The Computer Vision domain of Artificial Intelligence, enables machines to see through images or visual data, process and analyze them on the basis of algorithms and methods in order to analyze actual phenomena with images. |
| 7 | What do you mean by corpus?  In Text Normalization, we undergo several steps to normalize the text to a lower level. That is, we will be working on text from multiple documents and the term used for the whole textual data from all the documents altogether is known as corpus.  OR  A corpus is a large and structured set of machine-readable texts that have been produced in a natural communicative setting.  OR  A corpus can be defined as a collection of text documents. It can be thought of as just a bunch of text files in a directory, often alongside many other directories of text files. |
| 8 | Define:   * 1. Syntax b. Semantics   Syntax: Syntax refers to the grammatical structure of a sentence.  Semantics: It refers to the meaning of the sentence. |

**III.ANSWER ANY 3 QUESTIONS OUT OF GIVEN 5 QUESTIONS (3X 4M = 12 MARKS)**

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| 1 | Normalize the given text and comment on the vocabulary before and after the normalization: Raj and Vijay are best friends. They play together with other friends. |
| 2 | Explain how AI works in the following areas  a. Voice Assistants b. E-commerce websites  a.Voice assistant: AI is being used in voice assistants to recognize words spoken by the user. NLP has capabilities like “Speech-to-Text” convert the natural language of the user into text for further processing. As the digital assistant answers more and more queries, it “learns” using ML algorithms. The more tasks it performs, its ML algorithms help it “learn” from the tasks and the preferences of the user. As a result, the digital assistant improves its performance over time.  b. E-commerce website: With the use of big data, AI in E-Commerce is impacting customer choices by recording the data ofprevious purchases, searched products,and online browsing habits. Product recommendations provide multiple benefits for E-commerce retailers including: Higher number of returning customers. |
| 3 | Differentiate between a script-bot and a smart-bot. (Any 4 differences) |
| 4 | A firefighter has to get to a burning building as quickly as he can. There are three paths that he can take. He can take his fire engine over a large hill (5 miles) at 8 miles per hour. He can take his fire engine through a windy road (7 miles) at 9 miles per hour. Or he can drive his fire engine along a dirt road which is 8 miles at 12 miles per hour. Which way should he choose? (speed=distance/time)  To reach the destination quickly, the fire fighter has to calculate the time required on the basis of given data. Driving his fire engine 5 miles at 8 miles per hour takes 37.5 minutes. Driving his fire engine 7 miles at 9 miles per hour takes about 47 minutes. Driving his fire engine 8 miles at 12 miles per hour takes 40 minutes So he should choose to drive his fire engine over the hill.) |
| 5 | How intelligent robots are helping us in accomplishing dangerous jobs?  Robots let humans avoid some hurtful work:   1. Lifting up heavy material at the construction site. 2. Stirring and mixing metals or liquids at a high temperature. 3. Collecting and packaging of radioactive waste. 4. Working in contaminated and dusty environments. |

**………………ALL THE BEST…………………**